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Prof. Cope took the opportunity of correcting a misapprehension which had arisen with respect to the age of the Galisteo sandstones of New Mexico. Prof. Stevenson remarks that "a careful comparison of this section, as given by Dr. Hayden, with the details of the geology along Dr. Newberry's route from Santa Fe westward, as given in Ives' report, will, I think, satisfy everybody that Dr. Hayden has by some oversight inverted the order, and that the Galisteo group underlies the coal group. The Galisteo group is unquestionably the Triassic, as abundantly appears from the description of that system in New Mexico, by Newberry and Leconte." Prof. Cope had studied the Galisteo sandstone both on Galisteo Creek and on the eastern slope of the Zandia Mountains. In both localities he found it to underlie cretaceous No. 3, without the intervention of a coal bed. He therefore supposed it to be above the coal, as stated by Dr. Hayden, and a member of the cretaceous series, differing from some of the beds only in its red color. Its resemblance to the Trias he believed to be accidental.

The death of Wm. E. Whitman was announced.

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AUGUST 10.

The President, Dr. RUSCHENBERGER, in the chair.

Nineteen members present.

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AUGUST 17.

The President, Dr. RUSCHENBERGER, in the chair.

Fifteen members present.

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AUGUST 24.

The President, Dr. RUSCHENBERGER, in the chair.

Sixteen members present.

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AUGUST 31.

The President, Dr. RUSCHENBERGER, in the chair.

Twenty-two members present.

A paper entitled "On the Fossil Remains of Reptiles and Fishes from Illinois," by E. D. Cope, was presented for publication.

Mr. JOSEPH WILLCOX stated that he had observed lately the flight of grasshoppers in Colorado. On a cloudy afternoon the insects were on the wing, high in the air, in countless multitudes. A party of several persons were riding in a carriage and the question of probable rain was discussed. Suddenly the grasshoppers, with great unanimity, descended to the ground, the scene reminding one of a furious snow-storm. In two or three minutes no grasshopper could be seen in the air, and in a short time it commenced to rain. Soon after the rain ceased to fall, the insects took flight again, but in the course of half an hour, without any particular indication of rain, they suddenly plunged to the earth again. Soon after this it rained again. This process was repeated three times on that afternoon, and each descent was followed by a fall of rain.

*Genesis of Cassidaria striata, Lam.*—Mr. GABB called attention to a series of specimens illustrating the genesis of a recent species of mollusk. About 1850, Geo. B. Sowerby described a fossil from the Miocene formation of Santo Domingo, under the name of *Cassidaria lævigata*, which differed from the recent form *C. striata, Lam.*, in being a much more solid shell, with a broader body whorl, with decided varices, more expanded outer lip, markedly produced in a posterior lateral direction, little or no trace of teeth on the inner lip, and with a polished surface, or showing only obsolete traces of striation on the adult shell. The young specimens, however, are always striated, the inner lip is more or less crenulated, and the outer lip is not so expanded as in the adult. On comparing adults of *lævigata* and *striata*, no conchologist would hesitate for a moment in calling them distinct species. Later, a form was described by R. J. L. Guppy from a deposit in Jamaica, of the same geological age as the Dominican beds, and which differs in the adult stage from the Dominican fossils in having the juvenile characters persistent; that is to say, the spire is higher, the not very strong striation covers the body whorl, the thinner inner lip is crenulated throughout its entire length, the outer lip is less expanded and the three varices are only visible externally as trifling irregularities of the lines of growth, although they show internally as perfectly formed lips. This form was called by Mr. Guppy *C. sublævigata*, but in 1873, Mr. Gabb called attention to its small points of difference and reduced the name to the grade of a synonym of *lævigata*.<sup>1</sup> Later, Mr. Gabb has discovered, in the Pliocene deposits of Costa Rica, another shell, in which the progression of characters is continued. The spire is still higher, the lips less crenulated, the varices suppressed, the surface striation more marked, and, in short, the Costa Rica shell can hardly even be called a variety of *C. striata*, so close is it to the living species; and yet the connection between

<sup>1</sup> Tr. Amer. Philos. Soc. 1873, p. 222.

it and the Jamaica form, and through that with the Dominican, is equally perfect. In short, the shells from Costa Rica and Jamaica are the "missing links" between two well-marked and distinct species.

*Galeodea lintea*, Conrad (Proc. Phila. Acad. 1852, p. 199), from the Vicksburg Eocene, is a shell of an entirely different type, and, despite the opinion of that author, has no bearing on the present question. It is a true *Cassidaria*, with imperfect varices, and is tuberculated.

#### EXPLANATION OF THE PLATE.

Fig. 1, 1a, 1b. *C. lævigata*. Adult.

Fig. 2. *Cassidaria* from Costa Rica.

Fig. 3. *C. lævigata*, young, from Santo Domingo. Type of *C. sublævigata*, Guppy.

Fig. 4. *C. striata*, Lamarck.

The following papers were ordered to be published in the Journal: "On the Batrachia and Reptilia of Costa Rica." By E. D. Cope.

"On the Reptilia obtained by Dr. John N. Bransford, U.S.N., during the survey of Nicaragua of 1874." By E. D. Cope.

The committee to which they had been referred recommended the following papers to be published:—